HOMEWORK #7  CHAPTER 8

1. A. $\bar{x} - \mu$ measures the difference between the sample data and the hypothesized population mean.
   B. The standard error indicates how much difference between $\bar{x}$ and $\mu$ is expected by chance.

2. A. Type I error is rejecting a true $H_0$. This can occur if you obtain a very unusual sample with scores that are much different from the general population.
   B. Type II error is failing to reject a false $H_0$. This can occur when the treatment effect is very small.

3. A. The dependent variable is SAT score, and the independent variable is whether they take the special course or not.
   B. $H_0: \mu = 500$
   $H_1: \mu \neq 500$
   The critical boundaries are $\pm 1.96, Z = 2.10$
   Reject $H_0$. The course did affect SAT scores.
   C. With $\alpha = .01$, the critical boundaries are $\pm 2.58$
   D. Fail to reject $H_0$. With $\alpha = .01$, you have less risk of a Type I error. To reject $H_0$, a larger effect is required.

4. $H_0: \bar{x} = \mu$
   $H_1: \bar{x} \neq \mu$
   Critical region = $\pm 1.96$
   $\bar{x} = 3.36, Z = -.8$
   Fail to reject $H_0$.

5. $H_0: \bar{x} = \mu$
   $H_1: \bar{x} \neq \mu$
   Critical region = $\pm 1.96$
   $\sigma_{\bar{x}} = .53, Z = -4.72$
   Reject $H_0$. There is cultural difference.

6. No, the analyses cannot both be correct. For two-tailed tests, the critical region is the extreme 2.5% of each tail.
   The one-tailed test indicates that the data were in the extreme 1% of one tail of the distribution. This cannot be (impossible to find an effect in extreme 1% and not in 2.5% of tail).

7. Increasing alpha increases power and increases the risk of a Type I error.

8. $H_0: \mu \leq 80$
   $H_1: \mu > 80$
   Critical $Z = 1.65$
   $\bar{x} = 87.7, Z = 2.03$
   Reject $H_0$. 

9. $H_0: \mu \leq 80$
   $H_1: \mu > 80$
   Critical $Z = 1.65$
   $\bar{x} = 87.7, Z = 2.03$
   Reject $H_0$. 